

KA7515

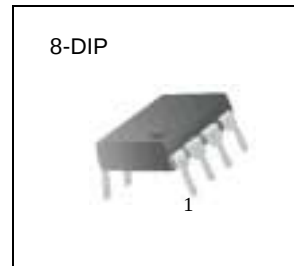
SMPS Controller

Features

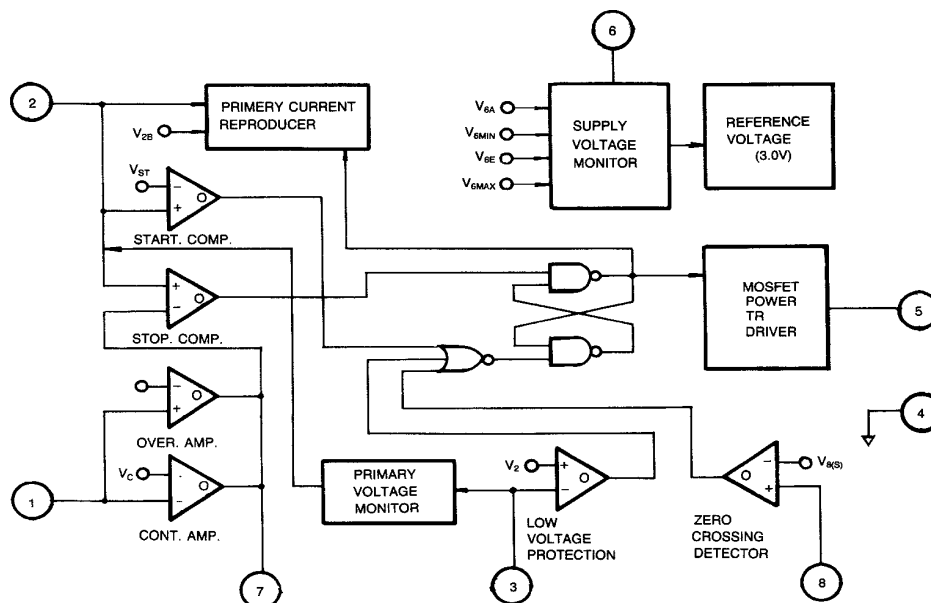
- Good load regulation over a wide load for external components.
- Internal soft-start for quiet start-up.
- Start-up supply current less than 1.6mA.
- Switch-off supply current less than 10mA.
- Burst operation under short-circuit conditions
- Thermal shutdown through over-temperature.

Description

The KA7515 provides the necessary features to implement switching mode power supply with a minimal external parts count. Internally implemented circuits include 3V reference voltage block, supply voltage monitoring block to control output through supply voltage and overload amplifier block to control output by external road variation. The KA7515 controls the power MOSFET and performs all necessary regulation and monitoring function in free running flyback converters.



Internal Block Diagram



Absolute Maximum Ratings (TA=25°C)

Parameter	Symbol	Value	Unit
Supply Voltage	V _{CC}	20	V
Collector Supply Voltage	V _C	13	V
Output current, Sink or Source	I _O	12	mA
Operating Temperature	T _{OPR}	-25 ~ + 85	°C
Storage Temperature	T _{STG}	-65 ~ + 150	°C

Electrical Characteristics (TA = 25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Start-up Hysteresis						
Start-up Current (1)	I _{ST1}	V ₆ = 5V	-	0.5	0.75	mA
Start-up Current (2)	I _{ST2}	V ₆ = 8V	-	1.0	1.5	mA
Start-up Current (3)	I _{ST3}	V ₆ = V _{6E}	-	1.1	1.6	mA
Switch On Voltage	V _{6E}	V ₁ = V ₄ = V ₈ = GND	11	12	13	V
Switch Off Voltage	V _{6A}	V ₁ = V ₄ = V ₈ = GND	6	6.5	7	V
Switch On Current	I _{6E}	V ₁ = V ₄ = V ₈ = GND	-	9.0	12.0	mA
Switch Off Current	I _{6A}	V ₁ = V ₄ = V ₈ = GND	-	8.0	10.0	mA
Voltage Limiter (Pin 2)	V ₂ (MAX)	V ₆ = 10V (IC Switch-Off)	5.8	6.8	7.8	V
Voltage Limiter (Pin 3)	V ₃ (MAX)	V ₆ = 10V (IC Switch-Off)	5.8	6.8	7.8	V
Control Input Voltage	V _I (CTRL)	V ₆ = 10V (IC Switch-On)	370	400	430	mV
Gain In Control Range	G _V (CTRL)	V ₆ = 10V (IC Switch-On)	48	51	54	dB
Basic Value	V _{2B}	V ₆ = 10V (IC Switch-On)	0.9	1.0	1.15	V
Maximum Peak Value	V ₂ (MAX)	V ₆ = 10V (IC Switch-On)	2.8	3.0	3.4	V
Overload Range Upper Limit	V _{IH}	V ₆ = 10V (IC Switch-On)	370	400	430	mV
Overload Range Lower Limit	V _{IL}	V ₆ = 10V (IC Switch-On)	60	200	290	mV
Gain In Overload Range	G _V (OVER)	V ₆ = 10V (IC Switch-On)	1	2	3	dB
Input Current	I _I	V ₆ = 10V (IC Switch-On)	90	140	180	μA
In Short-Circuit Operation						
Peak Value (1)	V ₂ (PK)1	V ₁ = 3.5V	2.8	3.0	3.4	V
Peak Value (2)	V ₂ (PK)2	V ₁ = 0V	2.35	2.65	2.95	V
Output Pulse Width	t _{w1}	V ₁ = 3.5V	3.5	5	6.5	μs
Output Pulse Width	t _{w2}	V ₁ = 0V	2.5	4	5.5	μs
Current Consumption (1)	I ₆₁	V ₁ = 3.5V	-	12	15	mA
Current Consumption (2)	I ₆₂	V ₁ = 0V	-	12	15	mA
Overload Point	-I ₂	V ₃ = V ₄ , V ₂ = 0V	400	660	850	μA

Electrical Characteristics (T_A = 25°C) (Continued)

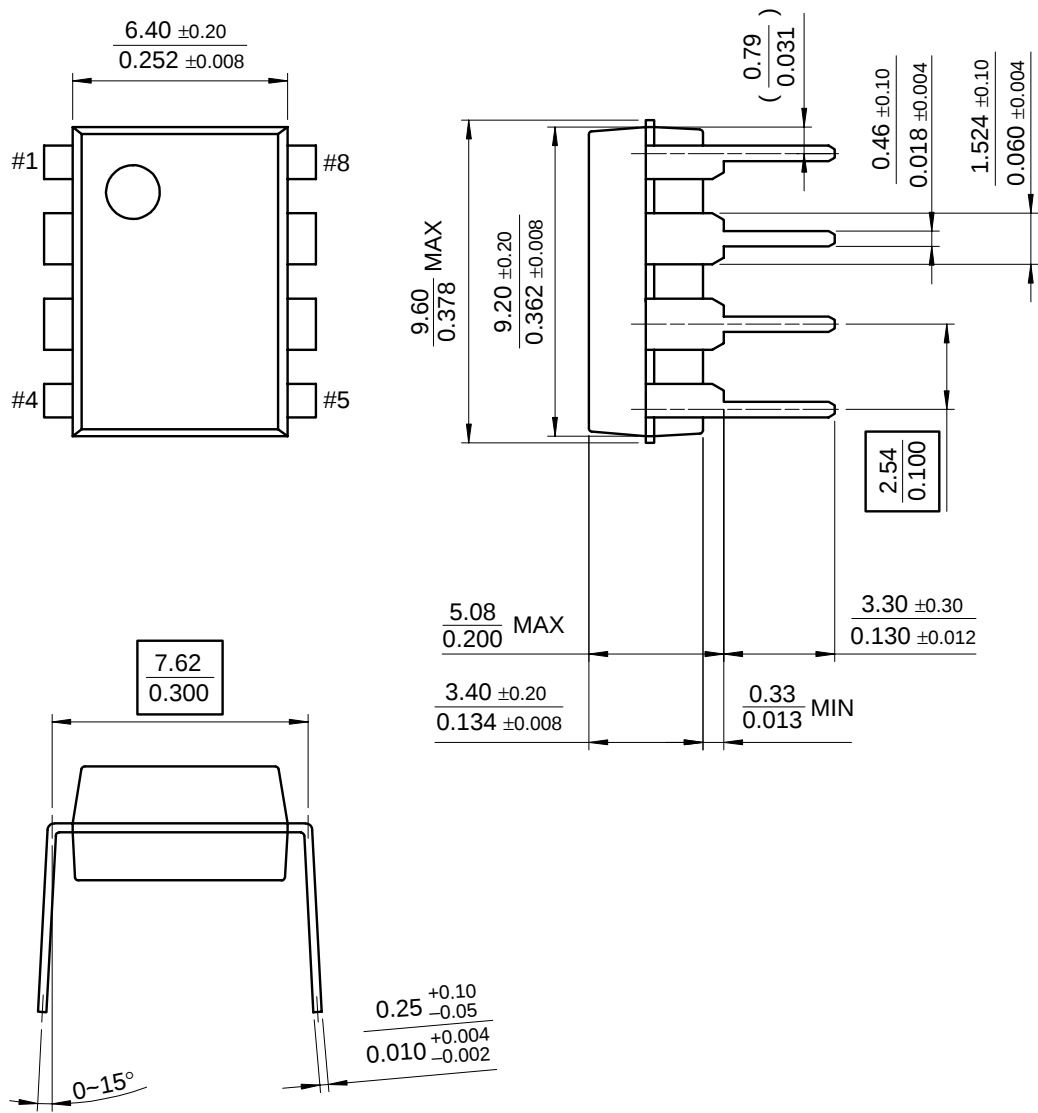
Correction Current						
Positive Value	V _{8(P)}	I ₈ = 1mA	0.7	0.75	0.8	V
Negative Value	V _{8(N)}	I ₈ = -1mA	0.15	0.22	0.25	V
Threshold Value	V _{8(S)}	-	40	50	60	mV
Delay Time	t _D	-	-	0.4	0.7	μs
Saturation Voltage (1)	V _{SAT1}	I ₅ = -1.0A	-	2.5	3.0	V
Saturation Voltage (2)	V _{SAT2}	I ₅ = 1.0A	-	2.5	3.0	V
Rising Edge	+dV ₅ /dt	V ₁ = 3.5V	4.0	50	-	V/μs
Falling Edge	-dV ₅ /dt	V ₁ = 3.5V	50	75	-	V/μs
Under VTG. Protection (1)	ΔV _{6(UV)}	V _{6MIN} = V _{6a} + ΔV ₆	0.3	0.5	1	V
Over VTG. Protection	V _{6(MAX)}	-	14	15	16	V
Under VTG. Protection (2)	V _{3(UV)}	-	0.925	1	1.075	V
Overtemperature	T _J	-	150	175	200	°C
Protection						
Voltage Pin 3	V ₃	I ₃ = 1mA	-	0.35	0.5	V

Mechanical Dimensions

Package

Dimensions in millimeters

8-DIP



Ordering Information

Product Number	Package	Operating Temperature
KA7515	8-DIP	-25 ~ + 85°C

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